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Bob Taft, Governor
Christopher Jones, Director

December 28, 2004

RE: NEASE CHEMICAL SUPERFUND SITE
COLUMBIANA COUNTY
FEASIBILITY STUDY
OHIO EPA COMMENTS

Ms. Mary Logan
Remedial Project Manager
U.S. EPA Region V
77 W. Jackson Blvd.
Chicago, IL 60604-3590

Dear Ms. Logan:

Enclosed is Ohio EPA's preliminary feedback on the Rutgers Organics Corporation (ROC)/Golder Associates November 2004 presentation for Operable Unit 3 (OU3, Middle Fork Little Beaver Creek) of the Nease Chemical Superfund Site in Salem, Ohio. The comments were primarily provided by the Division of Surface Water (DSW) personnel, based on the hard copy of the presentation that was sent to the DSW personnel earlier this month.

To support the comments, electronic copies (spreadsheets) of data from Ohio EPA's database have also been provided. Data from the Middle Fork Little Beaver Creek (MFLBC) watershed are provided in the spreadsheet titled "R&SPEST8" and data on mirex detections are provided in the spreadsheet titled "MIREX8." Note that the data are organized as a function of fish species to support the fish health advisories, but can be manipulated to provide information on spatial and temporal contaminant profiles. Additional information can be downloaded from Ohio EPA's database on request. I am also checking if additional sediment and/or surface water data on MFLBC are available in Ohio EPA's database.

Also, to provide a perspective on historical data, previous comments from the DSW personnel (Dave Altfater and John Estenik) on the "Middle Fork of the Little Beaver Creek, Ohio Impact Assessment Report" (Golder Associates, March 2000) are enclosed. These do not need to be transmitted to ROC, but are provided for your information, as we begin to evaluate remedial alternatives for OU3 (MFLBC).

Finally, as requested in our call with ROC earlier this month, below is information on Ohio EPA's DSW web sites. The general water quality standards are at: http://www.epa.state.oh.us/dsw/rules/3745-1.html, and the Biological Criteria guidance documents can be found at: http://www.epa.state.oh.us/dsw/formspubs.html.

I look forward to discussing these comments with you and transmitting them to ROC.

Sincerely,

for

Sheila Abraham, Ph.D
Site Coordinator/Risk Management ES-III
Division of Emergency and Remedial Response

SA/kss

enclosures: Hard Copies: Mirex in Fish Detections Spreadsheet ("MIREX8")
Middle Fork Watershed Data ("R&SPEST8")
E-Copies: Comments by Dave Altfater on the (Golder) March 2000 MFLBC Impact Assessment Report
Comments by John Estenik on the (Golder) March 2000 MFLBC Impact Assessment Report

ec: Dave Altfater, Ohio EPA, DSW-EAU, CO
Rod Beals, Ohio EPA, DERR, NEDO
Robert Davic, Ohio EPA, DSW, NEDO
John Estenik, Ohio EPA, DSW, CO
Steve Love, Ohio EPA, DERR, NEDO
Mylynda Shaskus, Ohio EPA, DERR, CO

OHIO EPA'S COMMENTS ON THE (NOVEMBER 2004) TECHNICAL TEAM MEETING PRESENTATION ON OPERABLE UNIT 3 (OU3) (MIDDLE FORK LITTLE BEAVER CREEK)

General Comments:

Several of the comments below are based on data/information that had not previously been provided to Rutgers Organics Corporation (ROC). The data may be relevant when developing a conceptual site model for Operable Unit 3 (OU3) for the Nease Site.

On slides titled "MFLBC Investigation Timeline" and "Available Data:"

It has recently been brought to my attention that, in addition to the 1999 fish data, data have also been collected in other years by the Division of Surface Water (DSW) on the Middle Fork Little Beaver Creek (MFLBC) watershed, as part of the stream monitoring program. An electronic copy of a spreadsheet ("R&SPEST8") from the DSW is enclosed, summarizing the data, including mirex detections, available in the MFLBC watershed. Additional data may be available in Ohio EPA's database, downloadable on request. As stated above, the data may be useful when developing a conceptual site model for OU3 (MFLBC) for the Nease Site.

On slide titled "MFLBC - Fish Summary:"

I. Does the range of concentrations cited refer to whole body samples or fish fillet data? Ohio EPA's data set shows mirex detections from 1990 in whole body samples as high as 6150 ug/kg, and 2900 ug/kg in fillets in 2001.

ii. Also, with respect to the extent of mirex contamination, in relation to the statement that in 1999 no ROC/Ohio EPA samples below the Lisbon Dam had Mirex detections – in Ohio EPA's data set, there are several fillets well above detection limits at river miles 10.9, 4.4, and 0.5, well below Lisbon Dam.

iii. Further, the statement was made that "LT level fish sampled more frequently and analyzed in place of UT level (e.g., carp, which is rarely eaten)." According to many personal statements made to the DSW personnel, carp do get eaten frequently enough to cause Ohio EPA and the Ohio Department of Health (ODH) to list them as part of the fish advisories. Also, several of the big game fish in Ohio that are most frequently consumed are UT level fish (e.g., walleye, saugeye, sauger, white bass, small and large mouth bass, etc.). This will need to be factored into the site conceptual model, in terms of edible fish species analyzed.

Please refer to the spreadsheets attached; again, the data may be useful when developing a conceptual site model for OU3.

On slide titled "MFLBC – Fish Summary 1999 Ohio Data:"

I. Please refer to the spreadsheets referenced above ("R&SPEST8"), which answer some of the questions on the slide (when and where the samples were taken, and analytical methodology used).

ii. Samples were collected following standard Agency protocol; see:

http://www.epa.state.oh.us/dsw/bioassess/BioCriteriaProtAqLife.html

Ohio EPA's DSW will be able to provide any additional information relevant to the sampling request.

iii. Data were analyzed using standard U.S. EPA methodology, see attached spreadsheet. Also, please refer to the "MIREX8 spreadsheet from the DSW, attached, which lists all mirex detections in Ohio EPA's database. Ohio EPA routinely analyses for mirex, along with other pesticides, as part of the stream monitoring program. Note that of the approximately 5800 samples analyzed, mirex was detected in only 200 samples. Of the 200 detections, all but eight were in the MFLBC watershed. Generally, data are routinely validated per standard protocol before entry into the database/system.

On the slides titled "Fish Results" (graphs):

Refer to the excel spreadsheet ("R&SPEST8") for graphs based on Ohio EPA's data, including the 2001 data. Note that fish with elevated mirex levels found downstream of the Lisbon Dam.

On the slides titled "Ohio Biocriteria Evaluation:"

Under Biocriteria Usage, a statement is made that a finding of non-attainment (biocriteria) requires the failure of all indices to meet their applicable criterion. This is inaccurate; Ohio EPA assigns non-attainment if ANY index is in the poor or very poor range.

On the slides titled "Ohio Biocriteria Evaluation:"

Under Habitat Criterion, the discussion on the Qualitative Habitat Evaluation Index (QHEI) and use attainment is not completely accurate. The statement is made that the QHEI must be greater than the 25th percentile of the WWH reference sites to determine biological attainability of a warm water stream and greater than the 75th percentile for exceptional streams. This is not true. The following is Ohio EPA's view on the use of the QHEI from DSW:

QHEI scores <45 are usually associated with streams that do not attain the WWH biocriteria and QHEI scores >60 usually do achieve the WWH or EWH criteria. QHEI scores greater than 75 are more likely associated with the EWH use. QHEI scores between 45 and 60 may fall into the range of the MWH or WWH biocriteria, depending on what habitat characteristics appear to be limiting the aquatic life. This intermediate range is wide, because such sites are found both in basins with generally good and generally poor habitat; this increases the range in the observed IBI scores. In contrast, sites with extreme QHEI scores (high and low) are less likely found in streams of the opposite range of habitat quality. Thus, the average habitat in a basin or homogeneous stream reach is important to the designation of aquatic life uses. Stream reaches with QHEI scores averaging >60 will likely have the potential to attain the WWH use. Average habitat quality in a homogeneous reach is most important to assigning and evaluating aquatic life uses.

End of Ohio EPA comments on the November 2004 Nease Technical Team Presentation on MFLBC

OhioEPA

State of Ohio Environmental Protection Agency

Interoffice Memorandum

To: Joe Trocchio, DERR, NEDO

From: John F. Estenik, Toxics Advisor, DSW, CO

Date: November 13, 2000 **DRAFT**

Subject: Middle Fork Little Beaver Impact Assessment Comments (Golder March 2000)

I have reviewed the document, "Middle Fork of the Little Beaver Creek Mahoning and Columbiana Counties, Ohio Impact Assessment Report" (Golder Associates, March 2000), per your request. I have generally limited my comments to fish tissue and sediment analytical results, and human health, wildlife, and food chain risks.

Fish Tissue Comments

Magnitude and Extent of Mirex Contamination

Section 3.3, last paragraph, last sentence.

"Most notable is the fact that fish tissue concentrations are significantly lower than in 1991, with the large majority of the current data below the FDA Advisory Level of 100 ppb." (Page 5)

I disagree with Golder's impact assessment of fish tissue contamination stated above. In general, fish tissue Mirex concentrations appear to be lower from the Rutgers' 1999 data when compared to 1991 data (samples collected during 1990). However, the data presented are misleading.

Forty (40) additional fish tissue fillet samples were collected throughout the Little Beaver Basin and analyzed by Ohio EPA, Sport Fish Tissue Monitoring Program, at Ohio EPA's Laboratory (Division of Environmental Services), during 1999, independent of the 1999 fish tissue samples collected and analyzed for this Study. Twenty (20) samples, representing nine species, were collected at three locations in the Little Beaver; two samples, representing two species, were collected at one location in the North Fork of the Little Beaver; 17 samples, representing 10 species, were collected at three locations in the Middle Fork Little Beaver; and one sample, representing one species, was collected at one location in the West Fork Little Beaver. **These Ohio EPA 1999 data were not included in the Middle Fork Little Beaver impact assessment conducted by Golder and Associates (March 2000).**

Mirex was quantified in all 1999 Ohio EPA samples collected and analyzed from the Middle Fork Little Beaver and in 19 of 21 samples collected and analyzed from the Little Beaver.

Twelve (12) (or 30%) of the 40 - 1999 fish fillet samples (representing five species) collected as part of Ohio's Sport Fish Monitoring Program exceeded the FDA's 100 ppb level of concern. The species exceeding 100 ppb included: Common carp, Hogsucker, Sauger, Smallmouth bass, and White sucker. Six (6) fillet samples collected below the Lisbon Dam in the Middle Fork Little Beaver exceeded 100 ppb; this represented three species and 60% of the 1999 Ohio EPA samples collected below the Dam.

Fish tissue analytical results were presented in Figures 6 (1999 data) and 7 (1991 data) (Golder, March 2000). The 1999 Rutgers' carp fillet data were not included in Figure 6. Four (4) carp fillet samples collected from river mile (RM) 23.5 to RM 33.3 had Mirex concentrations ranging from 320 ppb to 470 ppb (Golder, March 2000). Also missing is the result for a 1999 Bluegill fillet sample at RM 20.9 that had a Mirex concentration of 31.4 ppb. Including these data on Figure 6 results in a different perspective of the distribution and magnitude of fish tissue Mirex contaminant levels, based upon the Rutgers' fish tissue data.

If Ohio's 1999 Sport Fish Monitoring Program results are included with the Rutregs' 1999 sample results reported in the Golder Report (March 2000), the fish Mirex contaminant levels are approximately as high below the Lisbon Dam as they are above the Dam. The Golder Report (March 2000) included the analytical results of only three fish tissue samples collected below the Lisbon Dam at RM 4.4 and RM 1.9. The limited number of Rutgers' sample results provide an incomplete picture of fish tissue contaminant levels and their distribution in the Middle Fork Little Beaver.

The 1991 fish tissue sample with the reported highest Mirex concentration of 1,820 ppb was for a Yellow bullhead sample collected at RM 32.1. Yellow bullhead samples were collected at 10 locations in the Middle Fork Little Beaver during the Rutgers' 1999 fish sample collections. Only two Rutgers' 1999 Yellow bullhead samples, one collected at RM 38.3 and the other collected at RM 37.7, were analyzed. The samples had reported Mirex concentrations of 23.9 ppb and 60.9 ppb, respectively. Based upon Yellow bullhead historical results, the eight Rutgers' Yellow bullhead samples not analyzed may have had higher Mirex tissue concentrations than the other downstream fish species analyzed. Including Yellow bullhead fillet results throughout the Middle Fork Little Beaver reach being evaluated for possible impact may have resulted in higher fish tissue concentrations over a larger reach.

The second highest Mirex fillet concentration reported for the 1991 data (1990 samples) was for a mixed fillet sample collected at RM 25.3 in the Middle Fork Little Beaver. When the two highest fillet concentration sample results are removed from Figure 7 (Golder, March 2000), the 1999 Ohio EPA fillet data and the missing Rutgers' 1999 fillet data are added, and the resulting graph is placed over Figure 6 (Golder, March 2000), the magnitude of tissue contamination for the years 1991 and 1999 is similar. Also, the

distribution of more highly contaminated fillets is found over a greater length reach of the Middle Fork Little Beaver (from RM 39 to RM 1.9).

Possible Human Health and Wildlife Risks Due to Fish Consumption

Distribution of Mirex Contaminated Fish in the Little Beaver Basin

Section 3.2, last paragraph, next to the last sentence.

The statement was made that "Davey also noted the fact that the Lisbon Dam constitutes a physical barrier to fish migration." (Page 5)

The distribution of Mirex contamination in fish tissue in the Little Beaver Basin is more extensive than indicated by Rutgers' data in the March 2000 Report. The Rutgers' fish tissue evaluation limited fish sample collection and analyses to the Middle Fork Little Beaver. The 1999 Rutgers' limited sampling effort and sampling results provide an incomplete picture of fish tissue contaminant levels and their distribution throughout the Little Beaver Basin. There is nothing to prevent the movement and distribution of Mirex contaminated fish throughout the Little Beaver Basin upstream from the Lisbon Dam. Eighteen (18) of the 20 samples (representing nine species) collected during 1999 in the Little Beaver as part of Ohio's Sport Fish Monitoring Program tested positive for the presence of Mirex. One Common carp sample had Mirex present at 110 ppb. Two samples (two species) in Ohio EPA's 1999 sport fish monitoring effort also tested positive for Mirex in the North Fork of the Little Beaver.

The Lisbon Dam does not prevent the movement of fish downstream in the Middle Fork Little Beaver. This is one possible explanation for the distribution of contaminated fish downstream from the Dam. A second possible explanation is that the fish were exposed to contaminated sediment downstream from the Dam. A third possibility is that movement of fish downstream over the Dam and exposure to contaminated sediment downstream from the Dam are occurring simultaneously.

Human Health Risk Assessment

Fish Consumption

The extent of the Mirex impact to the Middle Fork Little Beaver, based upon the sport fish advisory reach length, has been increased. The previously existing fish consumption advisory issued for the Middle Fork Little Beaver from alternate State Route 14 at Allen Road to State Route 11 south of Lisbon has been modified starting with the 2001 fishing season. The advisory now extends from alternate State Route 14 at Allen Road to the Ohio-Pennsylvania State line (Bob Johnson, Ohio Department of Health, Personal Communication - 11/7/2000).

Wildlife Risk Assessment

Fish

Even fish tissue samples containing less than 100 ppb increase the risk of possible toxicological effects to wildlife. Whole-body Mirex contaminant levels would be 2.7 times the reported concentrations for 1999 fillet results following the procedures and assumptions used in Section 4.2, Food Chain Risks (Golder, March 2000, page 9). The only Hazard Quotient wildlife result referred to in the Golder Report (March 2000) was the Hazard Quotient of 2.5 for mink based upon 1991 data. The Hazard Quotient was recalculated using a 1999 average fillet Mirex concentration of 170 ppb and a whole-body to edible fish tissue ratio of 2.7, resulting in an estimated average whole-body Mirex concentration of 459 ppb. This resulted in a recalculated Hazard Quotient of 0.7. **The Hazard Quotient should be recalculated using all 1999 Middle Fork Little Beaver fillet data.** The most accurate procedure for determining a Hazard Quotient is to include adequate whole-body analytical results in the calculation, rather than an extrapolation of fillet to whole-body contaminant levels based upon an average fillet concentration multiplied by a whole-body to edible fish tissue ratio.

Turtles

Other wildlife that may be impacted at the Mirex concentrations found in this Basin include the snapping turtle. Snapping turtles concentrate organochlorine compounds from 10 to 100 times the concentrations found in fish from the same locations. In a draft (SOLEC) document (October 2000), costal wetland indicators included an assessment of selected analytes and contaminant concentrations that should not be exceeded in snapping turtle eggs. The proposed Mirex contaminant level that should not be exceeded in snapping turtle eggs is a mean wet weight of 0.0014 ug/g (page 36).

It should be noted that there is human consumption of snapping turtle muscle and other turtle parts by Ohio citizens. The future impact assessment of Mirex contaminant levels and distribution in the Little Beaver Basin should include an evaluation of snapping turtle tissues (because of possible human consumption) and snapping turtle eggs (to evaluate possible snapping turtle reproductive impacts).

Sediment

The sediment data reported by Golder (March 200) included % Total Organic Carbon (TOC) and % Fines. Actual % particle composition should also have been included (e.g., % clay and % sand).

Section 3.4, last sentence, page 6

Golder (March 2000) stated, "Again, the most notable feature in the data is that concentrations are much lower than in previous sampling, and this is probably reflective of natural burial of contaminated sediment."

The above statement does not necessarily accurately describe the current sediment contaminant levels and distribution throughout the Middle Fork Little Beaver based upon the interpretation of Rutgers' 1999 data. The distribution and magnitude of Mirex sediment contamination has not be adequately characterized in the Middle Fork Little Beaver upstream from the Lisbon Dam (RM 10.9). The 1999 sediment Mirex concentration at RM 37.7 may be contaminated at a lower concentration than the concentration reported in 1991. The 1999 sediment Mirex contaminant level at RM 36.6 is approximately two-fold higher than the concentrations reported in 1991 at RM 37.7. Some of the sediment locations that had the highest reported Mirex concentrations in the 1991 sampling were not resampled at the exact same location in 1999, example RM 35. The 1999 sediment Mirex concentration at RM 33.3 was about the same or slightly higher than the reported 1993 and 1995 sediment Mirex concentrations. There were no 1999 samples taken between RM 32 and RM 29, a previously identified, highly contaminated reach located in the Egypt Swamp.

The distribution and magnitude of Mirex sediment contamination has not been adequately characterized below the Lisbon Dam (RM 10.9). Two (2) locations below the Dam were resampled during the Rutgers' 1999 Study, RM 4.4 and RM 1.9. The highest sediment Mirex concentration reported in the 1991 data below the Lisbon Dam was collected at RM 13. The RM 13 location was not resampled during the 1999 Study. The highly contaminated fish tissue results reported by Ohio EPA for fish collected below the Dam (Ohio EPA 1999) resulted from the fish being exposed to Mirex somewhere in the Basin. It is not known if the exposure occurred above or below the Dam.

Sediment contaminant results can be influenced by a number of factors including: sampling method, sampling depth, sampling location, sample composition (i.e., the percent fines, clay, and sand present), activities instream or near-stream (e.g., dredging, adding fill, erosion, construction, etc.), major floods, stream hydrology, etc. Two (2) major floods have occurred in the Little Beaver Basin, since 1990. How the flooding events affected sediment and contaminant analyte concentration and/or distribution is not known.

High contaminant analyte concentration may be highly localized, as was evident in four (4) recent Ohio EPA Studies, "The Ohio EPA/Heidelberg College Lake Erie Basin Sediment Project Report" (Ohio EPA, December 1999), "The Ohio EPA Lake Erie Tributary Quarterly Sediment Sampling Project Report" (Ohio EPA, Report in preparation), "The Ohio EPA Lake Erie and Ohio Lake Erie Tributary and Turtle Collection Site Evaluation" (Ohio EPA, Report in preparation) and Fact Sheet: "Ottawa River Unnamed Tributary Remediation

Project (Ohio EPA, January 1997). Five (5) locations were sampled once and one location (RM 5.0) was sampled quarterly for two (2) years). In all, 12 sediment samples were collected in the Ottawa River (Toledo) from RM 5.1 to RM 1.5 (a total of six (6) locations). The Total PCB concentration for the samples ranged from 0.773 ppm at RM 1.5 to 4.708 ppm at RM 5.0. The quantification of PCBs in sediment at the reported instream range was significant. However, there was no indication from the Ottawa River sediment data that there was a ditch (Unnamed Tributary with an Ottawa River confluence at RM 6.0; recently named Fraleigh Creek) with sediment that contained 74,000 ppm Total PCBs upstream from the Ottawa River 5.1 RM sampling site. Based upon Ohio EPA experience, more than a few sediment samples are needed to adequately characterize the distribution and the magnitude of the contaminant concentration for an analyte of concern. Sediment sample results should include multiple transects with cores that are subsampled and analyzed, as was done recently by Ohio EPA in the Ottawa River (Toledo) sampling.

Future Little Beaver Basin Assessments for Contaminant Impact

All Little Beaver Basin data generated for the various media through time for Mirex and associated chemical contaminants of concern should be included in a future, comprehensive assessment. All sample concentrations should be shown as a geographically distributed presentation by matrix (example, benthic tissue concentration, water column concentration, flood plain soil concentration, etc.), by sample type (example, fish species tissue concentration and fish tissue sample type, etc.), by date, etc.

Additional ecosystem aquatic compartments beyond QHEI, IBI and ICI must be evaluated to determine the extent and magnitude of impact including:

1. The presence of a persistent contaminant(s) that is (are) biological available,

2. The presence of a fish consumption advisory at any advisory level,

3. The distribution and the magnitude of chemical contaminant(s) concentration(s) of concern in various matrices,

4. The possibility that the sediment may be toxic to benthic organisms. Sediment toxicity may not always be evident in ICI scores. The most accurate procedure to determine if the sediment is toxic and/or contains bioaccumulative analytes of concern is to perform *in situ* bioassay toxicity/uptake evaluations.

References:

Ohio EPA. December 1999. "The Ohio EPA/Heidelberg College Lake Erie Basin Sediment Project Report")

Ohio EPA. Report in preparation. "The Ohio EPA Lake Erie Tributary Quarterly Sediment Sampling Project Report"

Ohio EPA. Report in preparation. "The Ohio EPA Lake Erie and Ohio Lake Erie Tributary and Turtle Collection Site Evaluation"

Ohio EPA. January 1997. Fact Sheet: "Ottawa River Unnamed Tributary Remediation Project

MIDDLE FORK LITTLE BEAVER CREEK
IMPACT ASSESSMENT REPORT
GOLDER ASSOCIATES, MARCH 2000

Comments by David Altfater, Ohio EPA
December 8, 2000

Section 2.0, page 2: The concept of evaluating the recreational value of the fishery in the MFLBC was solely proposed and completed by ROC. Ohio EPA does not support/endorse the recreational value of the fishery concept, as detailed in the Field Survey Report prepared by Davey Resource Group.

Fish tissue sampling was proposed by ROC in a letter to Joe Trocchio and Anthony Rutter, dated February 23, 1999. However, Ohio EPA was not involved in developing a detailed scope of work for the fish tissue part of the workplan. In other words, we agreed that fish tissue sampling would be beneficial, but we were not involved in determining the number of fish samples collected per location.

In addition to the work stated on page 2, Ohio EPA collected four rounds of surface water samples at 17 locations in the MFLBC during July and August 1999. Chemical parameters included nutrients, metals, BOD, fecal coliform, and other conventional parameters. Fish tissue samples were also collected by Ohio EPA during 1999 within the MFLBC. These data are available electronically and should be included in the assessment report.

Section 3.0, page 4: Fish and macroinvertebrate sampling was conducted in the MFLBC during July and August 1999 (one macroinvertebrate sample was retrieved on Sept. 1).

Section 3.2, page 5: Although the upper reach (headwaters to approximately RM 21) has had sections channel modified in the past, I would disagree that habitat is "unsuitable" based on a recreational fish assessment. Some of the best habitat within the MFLBC was documented at RM 33.3, with a QHEI score of 84.0. This particular site had numerous deep pool areas interspersed with riffle and run areas - habitat conducive to supporting larger fish.

The statement that the Lisbon Dam (RM 12.5) constitutes a physical barrier to upstream fish movement has merit. After looking in detail at the fish community results from the 1999 sampling, a number of fish species collected downstream from the Lisbon Dam were not found upstream, despite adequate instream habitat. These species included smallmouth bass, golden redhorse, silver shiner, channel catfish, stonecat madtom, banded darter, freshwater drum, and seven other common species typically found in mid to larger streams. The predominant species collected downstream from the dam, but not collected upstream, are intolerant to moderately intolerant of pollution. I would hypothesize that these pollution sensitive species, at one time, were located upstream from the dam, but that past point source pollution killed off the more sensitive species of fish. This is possible, given that the MFLBC was listed as Limited Warmwater Habitat in the 1978

Water Quality Standards, with a variance for ammonia-N of 10 mg/l from the Salem WWTP downstream to the county line near Washingtonville; and historical information documented that a small plastics plant in Salem spilled biocide into a tributary to the MFLBC during 1983, causing at least a five mile fish kill in the MFLBC. In addition, the possibility that some of these sensitive species could have been recruited in from tributaries like Stone Mill Run and the East Branch appear unlikely, due to their own past pollution problems and small size. It appears to me that recruitment of the above noted fish can occur only from the MFLBC. Based on this hypothesis and some supporting research (Porto et al. 1999), the Lisbon Dam could be influencing the recovery potential of the MFLBC.

Section 3.3, page 5: Please be aware that Ohio EPA biologists (i.e., I) did not select fish specimens for fish tissue analyses during the survey. I was asked my opinion, and certainly was willing to give it concerning which species of fish to keep for analysis. My main role was providing fish from our biocriteria sampling event in July. In keeping with our (Ohio EPA's) normal fish tissue collecting procedure, we would have collected and analyzed more than one species per location, if adequate sized fish were available. And most importantly, I typically keep and analyze common carp because of their size, higher lipid content, consumption by people, and prevalence across the state. It should be noted that ROC did follow Ohio EPA protocol (Ohio EPA 1994) in the fish collection procedure; however, the procedure does not indicate the number of samples to collect per location. Any additional fish tissue samples should include analysis of lipid content. The review of fish tissue results and conclusions are adequately covered in John Estenik's email to you, dated November 27, 2000.

Section 3.4, page 6: The evaluation of sediment metals is inadequate. A detailed description of the metal screening values in relation to results is needed, and this can be accomplished within Table 6. The Ontario sediment guidelines have two levels of screening, and these should be noted in the report, along with how the results compare with these two levels. Please provide evidence for the statement that "exceedances may relate to coal mining/production operations, steel fabricators, and other dischargers to the MFLBC".

I disagree with the statement that natural burial of contaminated sediments is probably the reason for the lower mirex concentrations in sediment from previous samplings. First, comparison of sediment from one year to the next should include similarly paired sites. Samples from different years must be located relatively close together, and results should be normalized to %TOC. In addition, the percent of the sample comprised of silts and clays (<63um) should be known, with samples striving for <30% sand and larger particles. If this type of comparison and review of the data was completed, it is not explained or detailed in the report. Clearly, some of the highly elevated mirex sediment results were not evident during the 1999 sampling; however, is this a result of fewer samples in 1999, samples not co-located, or differences in TOC and particle size? I do not believe that significant natural burial of sediments is occurring in the MFLBC, rather downstream transport is more likely. In addition, the sediments collected during 1999 were sampled using a soil hand auger with the capability to sample six inches into the sediment. These samples could easily have included sediments buried from many years ago.

Section 3.5, page 6: The conclusions in this section are generally acceptable. However, dissolved oxygen in the MFLBC did not show significant impacts downstream from the Salem WWTP. The Golder Report should include Ohio EPA's surface water data, which is previously mentioned. In addition to grab water samples, Ohio EPA placed continuous recording datasondes in the MFLBC from upstream of the Salem WWTP to RM 25.8. These instruments recorded D.O., pH, temp., and conductivity hourly over a three day period in August 1999. The data are available electronically.

Section 4.1, page 7: This section does not adequately present the biological data collected by Ohio EPA in 1985 and 1999. At a minimum, a use attainment table needs to be completed detailing each site sampled and attainment of the applicable biocriteria. An example of this kind of table can be found in any biological and water quality report Ohio EPA has completed over the last 10 years.

The description of improvement in biological communities in the MFLBC between 1985 and 1999 is acceptable, however, more detailed information relating to why this has occurred is appropriate. The report says these changes likely result from improvements to the Salem WWTP and continued controls at the Nease Site. Additional information is necessary from both facilities - pollutant loadings changes at the Salem WWTP between 1985 and 1999 (particularly ammonia-N, chlorination, metals, BOD) and the specific controls at the Nease Site. This information would help to solidify the association between these two facilities and the improvements noted instream. The use designation process employed by Ohio EPA using Ohio Administrative Code is not correctly described in this section. Ohio EPA has not designated the MFLBC into three sections. The MFLBC is designated with two aquatic life uses: Warmwater Habitat from the headwaters to Lisbon Dam (RM 12.5) and Exceptional Warmwater Habitat from Lisbon Dam to the mouth. The fish biocriteria applicable to each use designation depends on the ecoregion, and sampling method employed (headwater, wading, or boat). The macroinvertebrate biocriteria are adjusted based on ecoregion.

Some clarification is necessary of the three bullet paragraphs ending page 7 and beginning page 8. Aquatic life use designations are assigned to waterbody segments based on the potential to support that use according to the State's narrative and numerical criteria. It is not necessary to observe actual attainment of the biocriteria in order to designate a particular use, particularly when assigning the Warmwater Habitat use. If this were so, there would be little if any impetus to improve and rehabilitate degraded aquatic systems. In Ohio, instream biocriteria are the arbiters of aquatic life use designations; however, habitat assessment data plays an integral role. The achievement of the biocriteria for a stream assures it of at least the associated designated use, regardless of the physical habitat at the site. The Golder report mis-states the quoted Ohio EPA sentence in the first bullet. Ohio EPA's users manual specifically states that "For EWH designation, only one of the three biological indices need demonstrate attainment of the EWH criteria outside of any areas of chemical degradation." With that said, the current practices of Ohio EPA require that both organism groups demonstrate attainment of the EWH criteria (outside of chemical degradation) for EWH designation (Yoder and Rankin1995). Based on a wealth of data collected within Ohio, stream segments meeting the requirements of a WWH

designation are capable of fully attaining the use in the absence of chemical contamination. If isolated sampling sites within a stream segment have extensive macro-habitat modifications, these certainly can and do influence biocriteria results. However, if the entire stream segment is primarily comprised of natural habitat features, short stretches of modified stream do not preclude application of WWH or EWH criteria. We have documented modified stream segments within prevailing natural habitat streams (Rankin 1995), which have achieved the applicable Clean Water Act use (WWH or EWH). The last sentence of the first bullet states that a finding of non-attainment requires a failure of all indices. In addition, non-attainment can occur when either organism group reflects a poor or very poor performance. The nonsignificant departure ranges mentioned in the second bullet (top of page 8) are 4 IBI or ICI units and 0.5 MIwb units. The last bullet in this group (2nd bullet page 8) is incorrect. The designation of the WWH use DOES NOT require that the QHEI score exceed the 25th percentile for WWH reference sites in the ecoregion. As stated previously, if the biocriteria for a stream attains the WWH criteria, than the stream is assigned the WWH use, regardless of the QHEI score. Using QHEI scores and the associated attributes of the index may be useful in the use designation decision making process. As reported by Rankin (1989), QHEI scores <45 are usually associated with streams that do not attain the WWH biocriteria and QHEI scores of >60 usually do achieve the WWH or EWH biocriteria. QHEI scores intermediate (45-60) may fall into the range of MWH or WWH biocriteria, depending on what habitat characteristics appear to be limiting aquatic life.

Section 4.1.1, page 8: No mention is made about the biological results from RM 38.2. This needs to be added. I disagree with the statement that the nonattainment at RM 40.3 is likely habitat related. Although habitat was somewhat marginal here, fish and macroinvertebrate results suggest enriched conditions. An onsite septic system discharges wastewater into the upstream section of this sampling site.

The discussions on mirex levels within this section should identify them as sediment values. Is the 480 ppb conservative screening level for mirex based on a toxicological endpoint for freshwater aquatic biota?

This section should include a discussion on water quality criteria exceedances for total dissolved solids associated with the Salem WWTP. These exceedances, along with extremely elevated total phosphorus levels instream, contribute to water quality impairment noted in the MFLBC.

Section 4.1.2, page 8: Within the Egypt Swamp area, the IBI and MIwb were not attaining the biocriteria at RM 25.8, while only the MIwb was not attaining the biocriteria at RM 28.8. The IBI at RM 28.8 was a nonsignificant departure of the biocriteria. Since habitat is most influential on fish community results, the non-attainment of the ICI at RM 20.9 while the fish community was fully attaining the biocriteria suggests habitat was not the cause of the low ICI. As for the two sites previously channel modified (RM 28.8 and RM 25.8), the influence of habitat is noted. However, the influence of elevated TDS and total phosphorus certainly contributed to the lower than expected results. The statement that for three sites (RMs 28.8, 25.8, and 20.9), the QHEI data indicate the WWH may not be attainable is incorrect.

And the statement that partial attainment likely reflects habitat conditions is incorrect, because surface water results are completely discounted.

Section 4.1.3, page 9: To properly evaluate the fish community results, the average IBI and MIwb from each site is compared to the appropriate biocriteria. The fourth sentence in this section should be deleted. Within the EWH section of the MFLBC, six locations were biologically sampled. Overall, results show that three locations (RMs 10.0, 8.4, and 1.9) were in full attainment, two locations were in partial attainment (RMs 10.7, 9.0), and one location (RM 4.4) was in non-attainment of EWH biocriteria. Based on field notes and observations, substrate embeddedness and sedimentation appeared to be problematic through much of the EWH segment.

Section 5.0, page 10: The 1999 survey of the MFLBC indicated a significant improvement only within a four mile section of stream immediately downstream from the Salem WWTP. Results between 1985 and 1999 were generally comparable in the lower 22 miles of stream. Areas in non-attainment of either the WWH or EWH use are NOT largely habitat related as stated in the report, but a combination of degraded surface water quality, sedimentation/embeddedness, and channel modifications. However, these conditions do not appear to be related to mirex levels in sediments of the MFLBC. Dr. Estenik has addressed the fish tissue conclusions in a separate email. The issue of significantly lower sediment values between 1991 and 1999 is debatable. Clearly, some of the highly elevated mirex sediment results were not evident during the 1999 sampling; however, as stated previously, is this a result of fewer samples in 1999, samples not co-located, or differences in TOC and particle size? Common carp data need to be included in any discussion of edible fish tissue results. In addition, tissue sampling conducted by Ohio EPA in 1999 confirmed elevated mirex levels for a number of fish species. This data needs to be included in any conclusions drawn about edible fish.

Table 1: This table should include a column for river mile locations.

Tables 2 - 4: River mile locations should be included.

Table 5: PAH compounds should be screened/evaluated using guidelines in Persaud et al. (1993). Include river mile locations.

Table 6: Metals should be screened/evaluated using guidelines in Persaud et al (1993). Results qualifiers should be noted at the bottom of the table. Include river mile locations.

Table 8: Time of dissolved oxygen samples should be noted.

Figure 1: Sampling locations between RM 10.9 and 8.4 are incorrect on the map.

Figure 2: Egypt Swamp does not exit at RM 24. It is more appropriately located at RM 25.5 or further upstream. Lisbon Dam is located at RM 12.5, not RM 10.7. Headwater and wading criteria do not apply to the ICI as noted in the figure description of nonsignificant departure.

Figure 3: As noted in Figure 2 comments, Egypt Swamp and Lisbon Dam are incorrectly located. This figure should present the 1999 data points as the average for the site, not each sample date individually.

Figure 4: See comments for Figure 3.

Figure 5: The shading in this figure should be deleted. It is not adequately explained and is misleading. Location of Lisbon Dam and Egypt Swamp is incorrect.

Figure 6: Common carp need to be added to this figure. Location of Lisbon Dam and Egypt Swamp is incorrect.

Figures 7-9: Location of Lisbon Dam and Egypt Swamp is incorrect.

Appendix B:

Page 1: Ohio EPA did not coordinate with Davey Resource Group to collect data to address the recreational value of the fisheries. Ohio EPA only collected fish and provided to Davey any requested specimens. Other than at RM 33.3, Ohio EPA did not coordinate with Davey concerning consensus on sediment collecting locations. Specific sediment collecting locations at biological sites were chosen and sampled exclusively by Davey personnel. Ohio EPA biologists did not select fish specimens for fish tissue analyses during the survey. I was asked my opinion, and certainly was willing to give it, concerning which species of fish to keep for analysis. My main role was providing fish from our biocriteria sampling event in July.

Page 3: I disagree that RM 32.0 supports a poorly developed riffle, run, and pool complex. See Ohio EPA QHEI sheet. Both RM 28.8 and 25.8 were channel modified in the past. However, both sites had riffle/run areas which were sampled during the fish and macroinvertebrate work.

Page 4: Habitats at RM 1.9 included an extensive section of riffle/run at the most upstream section of stream.

Page 6: Carp should be changed to common carp.

Page 8: I provided comments at an earlier date concerning the evaluation of recreational fisheries in the MFLBC. I would refer to those comments.

Page 10: As noted in previously dated comments, I do not agree with the statement that the MFLBC from RM 40.3 to RM 25.8 is unsuitable for recreational fisheries. Please note that Ohio EPA documented smallmouth bass in the MFLBC from RM 1.9 to RM 10.9. Dissolved oxygen readings in the MFLBC, as noted in Table 6, do indicate lower concentrations downstream from the Salem WWTP. However, none of the samples were exceeding water quality criteria and grab D.O. results offer limited useful data, because of diurnal swings. The list of dischargers mentioned is acceptable, however, more detailed

information is essential before discussions on potential sources of impairment are noted. Information on discharge parameters, pollutant loadings, specific location of the discharge, and flow volume are all important in evaluating a point source wastewater discharger.

Page 11: I would disagree that RM 23.5, 25.8, and 21.8 sampling locations were severely channel modified. My comments on the Lisbon Dam as a fish barrier are noted earlier. However, I would note that smallmouth bass are not a highly migratory species (Ed Rankin, personal communication).

Appendix C: The fish species list does not include sites RM 10.9, 9.9, 9.0, and 8.4.

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Ohio Environmental Protection Agency. 1994. Fish tissue guidance manual. Ohio EPA Technical Bulletin MAS/1994-11-1. Div. of Surface Water, Columbus, Ohio.

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